Annual Tropical Cyclone Report

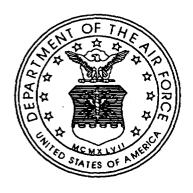
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- UNIVERSITY OF HAWAII

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FOREWORD

The Annual Tropical Cyclone Report is prepared by the staff of the Joint Typhoon Warning Center (JTWC), a combined Air Force/Navy organization operating under the command of the Commanding Officer, U.S. Naval Oceanography Command Center/Joint Typhoon Warning Center, Guam. JTWC was established 1 May 1959 when USCINCPAC directed USCINCPACFLT to provide a single tropical cyclone warning center for the western North Pacific region. The operations of JTWC are guided by CINCPACINST 3140.1T.

The mission of the Joint Typhoon Warning Center is multi-faceted and includes:

- 1. Continuous monitoring of all tropical weather activity in the Northern and Southern Hemispheres, from 180 degrees longitude westward to the east coast of Africa, and the prompt issuance of appropriate advisories and alerts when tropical cyclone development is anticipated.
- 2. Issuing warnings on all significant tropical cyclones in the above area of responsibility.
- 3. Determination of requirements for tropical cyclone reconnaissance and assignment of appropriate priorities.
- 4. Post-storm analysis of all significant tropical cyclones occurring within the western North Pacific and North Indian Oceans, which includes an in-depth analysis of tropical cyclones of note and all typhoons.
- 5. Cooperation with the Naval Oceanographic and Atmopheric Research Laboratory (NOARL), Monterey, California, on the operational evaluation of tropical cyclone models and forecast aids, and the development of new techniques to support operational forecast scenarios.

Satellite imagery used throughout this report represents data obtained by the DMSP network. The personnel of Detachment 1, 1WW, collocated with JTWC at Nimitz Hill, Guam, coordinate the satellite acquisitions and tropical cyclone reconnaissance with the following units:

Det 4, 20WS, Hickam AFB, Hawaii

Det 5, 20WS, Clark AB, Republic of the Philippines

Det 8, 20WS, Kadena AB, Japan

Det 15, 30WS, Osan AB, Korea

Air Force Global Weather Central, Offutt AFB, Nebraska

In addition, the Naval Oceanography Command Detachment, Diego Garcia, and Defense Meteorological Satellite Program (DMSP) equipped U.S. Navy ships have been instrumental in providing vital fixes of tropical cyclones in the Indian Ocean from satellite data.

Should JTWC become incapacitated, the Alternate Joint Typhoon Warning Center (AJTWC) located at the U.S. Naval Western Oceanography Center, Pearl Harbor, Hawaii, assumes warning responsibilities. Assistance in determining satellite reconnaissance requirements, and in obtaining the resultant data, is provided by the PACAF Weather Support Unit, Hickam AFB, Hawaii.

Changes in this year's publication include: a new list of tropical cyclone names was implemented after Typhoon Wayne (25W); old Annex A now appears under the heading Tropical Cyclone Warning Statistics, Track and Fix Data; the Satellite Reconnaissance section was expanded to include technique development efforts and future developments; and the numbering of the sections was modified to make indexing the material easier.

Special thanks to: Lieutenant Colonel Daniel J. McMorrow for his significant contributions and support; the men and women of the 27th Communications Squadron, Operating Location Charlie and the Operations and Equipment Support departments of the Naval Oceanography Command Center, Guam for their continuing support by providing high quality real-time satellite imagery; Marine Corps Air Station, Futenma, Japan for sharing their satellite imagery of tropical cyclones; the Pacific Fleet Audio-Visual Center, Guam for their assistance in the reproduction of satellite data for this report; to the Navy Publications and Printing Service Branch Office, Guam; Dr. Bob Abbey and the Office of Naval Research for their technical support to this publication and support to the University of Hawaii for the Post Doctorate Fellow at JTWC; Dr. Mark Lander for his training efforts and suggestions; the Australian Meteorological Service for the coastal radar reports on tropical cyclones via the AFTN to JTWC; National Weather Service Pacific Region for their able assistance installing the AMOS equipment at Ujae and Enewetak, and AFTN hardware at JTWC; and the Republic of the Marshall Islands for endorsing the AMOS installations at Ujae and Enewetak; Mr John Brown and Mr. David Saltzberger of the Naval Oceanographic Office for their efforts regarding buoys and the Local User's Terminal data.

Note: Appendix A contains definitions, Appendix B names of tropical cyclones, Appendix C references and Appendix D information on how to obtain past issues of the Annual Tropical Cyclone Report (titled Annual Typhoon Report prior to 1980).

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CONTRACTIONS

AB	Air Base	CINCPAC	Commander-in-Chief Pacific AF - Air Force, FLT - Navy	GOES	Geostationary Operational Environmental Satellite
ABIO	Significant Tropical Weather Advisory for the	CLD	Cloud	HATTRACK	Hurricane and Typhoon
	Indian Ocean	CLIM	Climatology		Tracking and Steering Program
ABPW	Significant Tropical Weather Advisory for the Western Pacific Ocean	CLIP or CLIPER	Climatology and Persistence Technique	НРАС	Mean of XTRP and CLIM Techniques (Half Persistence and Climatology)
ACFT	Aircraft	CM	Centimeter(s)	HR	Hour(s)
ADP	Automated Data Processing	CNOC	Commander Naval	ICAO	International Civil Aviation
AFB	Air Force Base	CNOC	Oceanography Command	10110	Organization
AFGWC	Air Force Global Weather	COSM or	Caralana Obiantina Stantina	INIT	Initial
	Central	COSMOS	Cyclops Objective Steering Model Output Statistics	INST	Instruction
AIREP	Aircraft (Weather) Report (Commercial and Military)	CPA	Closest Point of Approach	IR	Infrared
AMOS	Automatic Meteorological	CPHC	Central Pacific Hurricane Center	KM	Kilometer(s)
	Observing Station			KT	Knot(s)
AOR	Area of Responsibility	CSC	Cloud System Center	LAN	Local Area Network
APT	Automatic Picture Transmission	CSUM	Colorado State University Model	LLCC	Low-Level Circulation Center
ARGOS	International Service for Drifting Buoys	CYCLOPS	Tropical Cyclone Steering Program (HATTRACK and MOHATT)	LUT	Local User's Terminal
ATCF	Automated Tropical Cyclone	DDM	Defense Data Network	LVL	Level
	Forecast System	DDN		M	Meter(s)
ATCM	Advanced Tropical Cyclone Model	DEG	Degree(s)	MAX	Maximum
AUTODIN	Automated Digital Network	DFS	Digital Facsimile System	MB	Millibar(s)
AWDS	Automated Weather	DMSP	Defense Meteorological Satellite Program	MET	Meteorological
	Distribution System	DSAT	Digital Satellite Acquitition	MIN	Minimum
AWN	Automated Weather Network		System	MM	Millimeter(s)
BT LAT	Best Track Latitude	DSN	Defense Switched Network	МОНАТТ	Modified HATTRACK
		DTG	Date Time Group	MOVG	Moving
BT LON	Best Track Longitude	DWIPS	Digital Weather Image		<u> </u>
BT WN	Best Track Wind		Processing System	MSLP	Minimum Sea-level Pressure
CCWF	Combined Confidence Wieghted Forecast	FI	Forecast Intensity (Dvorak)	NARDAC	Naval Regional Data Automation Center
CDO	Central Dense Overcast	FNOC	Fleet Numerical Oceanography Center	MAG	
CI	Cirriform Cloud or Cirrus (or) Current Intensity (Dvorak)	FT	Feet	NAS NEDN	Naval Air Station Naval Environmental Data
		GMT	Greenwich Mean Time	MEDIA	Network

NEDS	Naval Environmental Display Station	PACDIGS	Pacific Digital Information Graphics System	TOGA	Tropical Ocean Global Atmosphere
NEPRF	Naval Environmental Prediction Research	PACMEDS	Pacific Meteorological Data System	TS	Tropical Storm
NESDIS	Facility National Environmental	PACOM	Pacific Command	TUTT	Tropical Upper-Tropospheric Trough
Satellite, Data, and		PCN	Position Code Number	TY	Typhoon
MEGN		PDN	Public Data Network		
NESN	Naval Environmental Satellite Network	PIREP	Pilot Weather Report(s)	TYAN	Typhoon Analog (Program)
NM	Nautical Mile(s)	POS ER	(Initial) Position Error	TYMNET	Time-Sharing Network: Commercial wide area network connecting micro-
NOAA	National Oceanic and	RADOB	Radar Observation		and mainframe computers
	Atmospheric Administration	RECON	Reconnaissance	ULAC	Upper-Level Anticyclone
NOARL	Naval Oceanographic and Atmospheric Research	RRDB	Reference Roster Data Base	ULCC	Upper-Level Circulation Center
	Laboratory	RSDB	Raw Satellite Data Base	USAF	United States Air Force
NOCC	Naval Oceanography	SAT	Satellite		
	Command Center	SEC	Second	USN	United States Navy
NODDES	Naval Environmental Data Network Oceanographic Data	SDHS	Satellite Data Handling	VIS WESTPAC	Visual
	Distribution and Expansion System		System		Western (North) Pacific
NODDS	Navy/NOAA Oceanographic	SFC	Surface	WMO	World Meteorological Organization
NODDS	Data Distribution System	SGDB	Satellite Global Data Base	WRNG	_
NOGAPS	Navy Operational Global	SLP	Sea-Level Pressure		Warning(s)
Atmospheric Prediction System		SSM/I	Special Sensor Microwave/	WW ER	Wind Warning Error
NRPS or			Imager	W#	Warning Number
NORAPS	Navy Operational Regional Atmospheric Prediction	SST	Sea Surface Temperature	XTRP	Extrapolation
	System	STNRY	Stationary	Z	Zulu Time (Greenwich Mean Time)
NSDS	Naval Satellite Display System	ST	Subtropical	24 ER	24-Hour (Position) Error
Made a	•	STR	Subtropical Ridge		
NSDS-G	Naval Satellite Display System - Geostationary	STY	Super Typhoon	48 ER	48-Hour (Position) Error
NWOC	Naval Western	TAPT	Typhoon Acceleration	72 ER	72-Hour (Position) Error
	Oceanography Center		Prediction Technique	24 WE	24-Hour Wind (Warning) Error
NWS	National Weather Service	TC	Tropical Cyclone	48 WE	48-Hour Wind (Warning)
NR	Number	TCFA	Tropical Cyclone Formation Alert		Error
NRL	Naval Research Laboratory	TTD.		72 WE	72-Hour Wind (Warning)
OBS	Observations	TD	Tropical Depression		Error
ONR	Office of Naval Research	TDA	Typhoon Duty Assistant		
ОТСМ	One Way (Interactive) Tropical Cyclone Model	TDO	Typhoon Duty Officer		
		TIROS	Television Infrared Observational Satellite		

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